

NARRATIVE

TO: Jeng-Hon Su

FROM: Nada Osman

DATE: January 13th, 2022

Facility Name: **White County Mouldings**
AIRS No.: 04-13-311-00018
Location: Cleveland, GA (White County)
Application #: 28161
Date of Application: October 25th, 2021

Background Information

White County Mouldings (hereinafter, “facility”) operates a sawmill for the manufacture of rough and dimensional lumber, located at 176 Appalachian Trail Drive in Cleveland, Georgia. The facility is in White County, which is an attainment county for all criteria pollutants. Emission units at the facility include a 16.3 MMBtu/hr wood-fired boiler, a lumber grader and planer, two wood hogs, rough mills and molders, a storage silo, and nine steam-heated drying kilns. The facility also has a backup 9.8 MMBtu natural-gas-fired boiler that is exempt from permitting under Georgia Rule 391-3-1-.03(6)(i)3(b)(1).

The facility has the potential to emit major amounts (>100 tpy) of particulate matter (PM) based on pre-control emission factors, but it uses a multiclone, three filters (baghouses), and two cyclones to keep PM emissions from the entire facility below 100 tons per year (tpy). Potential emissions of hazardous air pollutants (HAP) and all other criteria pollutants are each below their associated Title V major source thresholds. As a result, the facility is considered a synthetic minor source of PM under Title V of the 1990 CAAA.

White County Mouldings does not currently operate under any existing air quality permits.

Facility operations begin with the purchase of dry and green hardwood and cypress lumber. Dry lumber is sent directly to be processed in a series of wood processing units, including the lumber grader and planer, rough mills and molders, and wood hogs. Green lumber is first dried in the kilns before moving to the wood processing units. Final products produced by the facility include planed, ripped, and molded lumber products.

Purpose of Application

On October 29th, 2021, the Division received Application No. 28161 from White County Mouldings for the operation of the previously unpermitted sawmill. A Public Advisory was issued for this application.

Equipment List

Table 1: Emission Units and Associated Control Devices

Emission Units		Associated Control Devices		
Source Code	Description	Source Code	Description	Stack ID
WP1	Lumber Grading and Planer	CYA	Cyclone A	SCA
WH1	Wood Hog 1	CYB	Cyclone B	SCB
WP2	Rough Mill and Molders	BHA	Filter A	SBA
		BHB	Filter B	SBB
S1	Silo	BHC	Filter C	SBC
WH2	Wood Hog 2			
DK1	9 Drying Kilns	--	--	--

Table 2: Fuel Burning Equipment

Source Code	Input Heat Capacity (MMBtu/hr)	Description	Installation Date	Associated Control Device		
				Source Code	Description	Stack ID
B1	16.3	Wood-Fired	1985	MC1	Multiclone	SB1

Emissions Summary

The facility initially submitted an application requesting status as a true minor source, on the basis that the potential-to-emit (PTE) for each criteria air pollutant and single and combined HAP were each below their respective major source thresholds. However, the PTE values provided by the facility were after-control values—in particular, the PM PTE was reported as 93.97 tpy, meaning that uncontrolled PM emissions would be higher than the 100 tpy. The Division brought this to the attention of the facility, and they decided to request a synthetic minor status for PM instead, with the synthetic minor limit requiring them to always operate their control devices while the associated emission units are in operation.

The facility used emission factors found in AP-42 Chapters 1.4 and 1.6, emission factors used in some previous applications for other similar sawmills, control device vendor guaranteed grain loading factors, and emission factors found in 40 CFR 98 Subpart C to calculate the facility-wide potential-to-emit (PTE). As discussed previously, PM/PM₁₀/PM_{2.5} PTE are after-control emission rates.

Potential emissions were calculated based on 8,760 hours per year of operation.

Table 3: Facility-Wide After-Control Emissions

Pollutant	Emissions	
	Potential (tpy)	Actual (tpy)
PM/PM ₁₀ /PM _{2.5}	94.7/95.4/95.0	26.26
NO _x	39.2	33.55
SO ₂	1.81	1.71
CO	46.4	41.08
VOC	3.31	1.79
Max. Individual HAP	1.36	0.301
Total HAP	2.51	2.28
Total GHG (if applicable)	20,000	14,346.16

Table 4: Facility-Wide Emissions from all Processes (tpy)

Pollutant	16.3 MMBtu Wood Boiler	Kilns	9.8 MMBtu NG Boiler	BHA	BHB	BHC	CYA	CYB	TOTAL
NO _x	34.98		4.21						39.2
CO	42.84		3.53						46.4
SO ₂	1.78		0.0252						1.80
VOC	1.21	1.86	0.231						3.30
PM	2.86	0.728	0.320	12.61	15.49	5.89	28.38	28.38	94.7
PM ₁₀	3.78	0.541	0.320	12.61	15.49	5.89	28.38	28.38	95.4
PM _{2.5}	3.43	0.515	0.320	12.61	15.49	5.89	28.38	28.38	95.0
Formaldehyde	0.314		0.00316						0.317
Methanol	--		--						--
HCl	1.35		--						1.35
Arsenic	0.00157		0.00000842						0.00158
Chromium VI	0.000250		0.0000589						0.00031
Combined HAP	2.43		0.0795						2.51
Total GHG	14,960		5,026						20,000

Regulatory Applicability**40 CFR 60, Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units**

Since Boiler B1 was constructed before June 9, 1989, it is not subject to 40 CFR 60 Subpart Dc.

40 CFR 63, Subpart JJJJJJ – NESHAP for Industrial, Commercial, and Institutional Boilers for Area Sources

Since the facility is an area source for HAP emissions, the wood fired boiler (ID No. B1) is subject to 40 CFR 63 Subpart JJJJJJ. According to 40 CFR 63.11194(b), B1 is an existing boiler; since it is not equipped with any oxygen trim system, it is subject to the biennial tune-up requirements specified in Item 6. of Table 2 to 40 CFR 63 Subpart JJJJJJ and the one-time energy assessment requirement specified in Item 16. of Table 2 to 40 CFR 63 Subpart JJJJJJ. B1 is not subject to any emission limits specified in Table 1 nor any operating limits specified in Table 3 to 40 CFR 63 Subpart JJJJJJ.

Georgia Rule 391-3-1-.02(2)(b), Visible Emissions

Georgia Rule (b) limits the visible emissions from all manufacturing processes not to exceed 40% opacity. PM emissions from most of the facility's processes are controlled by baghouses and cyclones, and therefore, the facility's visible emissions are expected to be compliant with Georgia Rule (b).

Georgia Rule 391-3-1-.02(2)(d), Fuel Burning Equipment

Georgia Rule (d) limits the emission of fly ash and other particulate matter from fuel burning equipment with a capacity between 10 MMBtu/hr and 2,000 MMBtu/hr. Wood fired boilers tends to emit some PM emissions, and the Division would typically require that facilities demonstrate compliance with the GA Rule (d) PM emission limits by conducting periodic PM performance testing and monitoring pressure drop of the control device (ID No. MC1).

Georgia Rule 391-3-1-.02(2)(e), Particulate Matter Emission from Manufacturing Processes

Georgia Rule (e) limits particulate matter emissions based on process input weight rate. PM emissions from wood processing operations are controlled by a variety of baghouses and cyclones. Therefore, the facility is expected to comply with Georgia Rule (e) PM limits.

Permit Conditions

Condition 2.1 requires the facility to always operate all control devices while their associated emission units are in operation in order to avoid exceeding the 100 tpy Title V major source threshold for PM.

Condition 2.2 restricts the facility to processing only hardwood lumber because the facility's VOC PTE calculations from the drying kilns are valid only for the drying of hardwood lumber.

Condition 2.3 restricts the facility to firing only wood in Boiler B1. This requirement subsumes the fuel sulfur requirement of Georgia Rule (g).

Condition 2.4 subjects the facility to the applicable requirements of 40 CFR 63, NESHAP Subparts A and JJJJJ.

Condition 2.5 limits the opacity of emissions from all manufacturing processes to less than 40%, per GA Rule (b).

Condition 2.6 contains limits for the rate and opacity of any particulate matter emissions from all fuel burning equipment in the facility, per GA Rule (d).

Condition 2.7 subjects the facility's manufacturing processes to GA Rule (e) particulate matter emissions limitations.

Condition 4.2 requires the facility to maintain an inventory of baghouse filter bags.

Condition 4.3 requires the facility to operate Boiler B1 with good safety and air pollution control practices. This is a general requirement for maintaining compliance with 40 CFR 63 Subpart 6J.

Condition 5.2 requires the facility to conduct an initial performance tune-up of Boiler B1 and to submit a Notification of Compliance Status to the Division confirming the initial tune-up, per 40 CFR 63.11214(b). Tune-up procedures and requirements are included in Condition 5.3, and details for submitting the notification are included in Condition 7.1.

Condition 5.3 requires the facility to conduct a biennial performance tune-up of Boiler B1 to demonstrate continuous compliance with 40 CFR 63 Subpart 6J. The condition also lists procedures and requirements for conducting the tune-ups.

Condition 5.4 requires the facility to perform a daily check of visible emissions from the baghouses and to keep a record of the checks. The condition also includes requirements and procedures for performing the checks.

Condition 5.5 requires the facility to install a differential pressure indicator on each control device and record the pressure drop data for each day the associated emission unit/process is in operation.

Condition 6.2 requires the facility to conduct initial PM performance tests on Boiler B1.

Condition 6.3 requires the facility to conduct PM emissions tests on Boiler B1 biennially in order to demonstrate compliance with GA Rule (d) PM and visible emission limits. If any test result is less than 50% of the associated standard, the testing frequency can be relaxed from every 24 months to every 48 months.

Condition 6.4 requires the facility to establish a minimum pressure drop across Multiclone MC1 during the most recent performance test conducted in accordance with Conditions 6.2 and 6.3.

Condition 7.1 requires the facility to submit a signed Notification of Compliance Status to the Division certifying that the initial tune-up of Boiler B1 required by Condition 5.2 was conducted.

Condition 7.2 requires the facility to prepare a compliance report for Boiler B1 by March 1 of each biennial period in order to demonstrate continuous compliance with 40 CFR 63 Subpart 6J.

Condition 7.3 specifies the records required to be kept for Boiler B1 in order to demonstrate continuous compliance with 40 CFR 63 Subpart 6J.

Toxic Impact Assessment

Potential emission rates of various HAP emitted by the facility were compared with the associated maximum emission rate (MER) for each pollutant. Potential emissions of six HAP, shown in Table 5, exceeded their associated MER—acrolein, benzene, formaldehyde, arsenic, manganese, and chromium VI mist.

Table 6: PTE of Key HAP and Corresponding MER

Pollutant	CAS Number	Potential Emissions (ton/yr)	Potential Emissions (lb/hr)	Potential emissions (lb/yr)	Maximum Emission Rate (MER) (lb/yr)	Greater than MER?
Acrolein	107-02-8	9.07E-03	2.07E-03	1.81E+01	4.87E+00	YES
Benzene	71-43-2	3.00E-01	6.85E-02	6.00E+02	3.16E+01	YES
Formaldehyde	50-00-0	3.14E-01	7.17E-02	6.28E+02	2.67E+02	YES
Arsenic	744-038-2	1.57E-03	3.58E-04	3.14E+00	5.67E-02	YES
Manganese	7439-96-5	1.14E-01	2.60E-02	2.28E+02	1.22E+01	YES
Chromium VI (mist)	185402-99-2	2.50E-04	5.71E-05	5.00E-01	1.95E-02	YES

The facility submitted a toxic impact analysis of the six HAP in order to demonstrate compliance with the Georgia Toxic Guidelines. SCREEN VIEW modeling was used to calculate the maximum ground level concentrations (MGLC) of each key HAP. Since most of the facility's potential HAP emissions are associated with Boiler B1, all emissions were assumed to emit from its associated stack (SB1) in order to generate the most conservative result. Note that the Division conservatively assumed that Multiclone MC1 has little control efficiency over the heavy metals in fine particulate form and has revised the modeling results accordingly. A summary of the modeling results is shown in Table 6.

Table 7: Summary of Toxic Impact Analysis

Pollutant	AAC, µg/m3		SCREEN3 Modeling Results/MGCL, µg/m3			Acceptability of the Predicted MGCL/Ambient Impact	
	15-Minute	Annual	1-Hour	15-Minute	Annual	15-Minute Impact	Annual Impact
Acrolein	2.30E+01	2.00E-02	7.85E-03	1.04E-02	6.28E-04	Acceptable	Acceptable
Benzene	1.60E+03	1.30E-01	2.60E-01	3.43E-01	2.08E-02	Acceptable	Acceptable
Formaldehyde	2.45E+02	1.10E+00	2.72E-01	3.59E-01	2.18E-02	Acceptable	Acceptable
Arsenic	2.00E-01	2.33E-04	1.36E-03	1.80E-03	1.09E-04	Acceptable	Acceptable
Manganese	5.00E+02	5.00E-02	9.89E-02	1.31E-01	7.91E-03	Acceptable	Acceptable
Chromium VI (mist)	--	8.00E-05	2.16E-04	--	1.73E-05	--	Acceptable

Based on a unit emission rate of 1 pound per hour (lb/hr), the Unit MGLC was found to be 3.79 micrograms per meter cubed ($\mu\text{g}/\text{m}^3$), located at a distance of 436 meters from the stack. Each pollutant's MGLC is less than its associated annual and 15-minute acceptable ambient concentration (AAC). Therefore, all pollutants emitted comply with the Georgia Air Toxic Guidelines.

MER and AAC values for each HAP were referenced from Appendix A of the Summary of Ambient Impact Assessment of Toxic Air Pollutant Emissions (2018).

Summary & Recommendations

White County Mouldings operates an existing, unpermitted sawmill in Cleveland, GA. The facility is a synthetic minor source for PM and a minor source of all other criteria pollutants and HAP. The Mountain District – Cartersville Office will be responsible for compliance and inspection of this facility.

I recommend the issuance of Permit No. 5031-311-0018-S-01-0 to White County Mouldings. The Public Advisory for the facility expired on December 3rd, 2021. No comments were received.